



Division of Water Resources / State Revolving Fund Loan Program

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FINDING OF NO SIGNIFICANT IMPACT

Approval of Facilities Plan

Franklin (Williamson County), Tennessee

Loan Nos. CG5 2017-375 and SRF 2017-376 and SRF 2017-398

June 23, 2017

The National Environmental Policy Act requires federally designated agencies to determine whether a proposed major agency action will significantly affect the environment. One such major action, defined by Section 511(c)(1) of the Clean Water Act, is the approval of a facilities plan prepared pursuant to Title VI of the Clean Water Act. In making this determination, the State Revolving Fund (SRF) Loan Program assumes that all facilities and actions recommended by the plan will be implemented. The state's analysis concludes that implementing the plan will not significantly affect the environment; accordingly, the SRF Loan Program is issuing this Finding of No Significant Impact (FNSI) for public review.

The City of Franklin has completed the facilities plan entitled "Franklin Water Reclamation Facility Projects" dated August 2015. The facilities plan provides recommendations for improvements to the wastewater treatment system serving the City of Franklin. This project includes upgrading and expanding the existing wastewater treatment plant (WWTP) to a design capacity of 16 million gallons per day (mgd), constructing 16 mgd of biosolids treatment capacity comprised of thermal hydrolysis, anaerobic digestion, and dewatering at the existing WWTP, and adding reclaimed water customers to the existing reclaimed water distribution system through the expansion of the on-site pump station. The total estimated project cost is \$112,875,000. Two Clean Water State Revolving Fund (CWSRF) loans have been requested for this project. The first loan (CG5 2017-375) will be for \$1,275,000 and will have \$225,000 in principal forgiveness that will not have to be repaid by the City. The second loan (SRF 2017-376) will be for \$78,500,000. The City will apply for a third loan (SRF 2017-398) for \$20,000,000. The City will fund the remaining portion of the costs.

Attached is an Environmental Assessment containing detailed information supporting this proposed action. Comments supporting or disagreeing with this proposed action received within 30 days of the date of this FNSI will be evaluated before we make a final decision to proceed.

If you wish to comment or to challenge this FNSI, send your written comment(s) to:

Mr. Sam R. Gaddipati, Environmental Manager
Division of Water Resources, State Revolving Fund Loan Program
William R. Snodgrass TN Tower, 12th Floor
312 Rosa L. Parks Avenue, Nashville, TN 37243

or call or e-mail (615) 532-0462 or sam.gaddipati@tn.gov.

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A. PROPOSED FACILITIES AND ACTIONS; FUNDING STATUS

The City of Franklin has completed the facilities plan entitled "Franklin Water Reclamation Facility Projects" dated August 2015. The facilities plan provides recommendations for improvements to the wastewater treatment system serving the City of Franklin. This project includes upgrading and expanding the existing wastewater treatment plant (WWTP) to a design capacity of 16 million gallons per day (mgd), constructing 16 mgd of biosolids treatment capacity comprised of thermal hydrolysis, anaerobic digestion, and dewatering at the existing WWTP, and adding reclaimed water customers to the existing reclaimed water distribution system through the expansion of the on-site pump station. The facilities planning area and project location are indicated on Figure No. 1 of this Environmental Assessment. Descriptions of the proposed facilities and actions included in this project are listed below:

TREATMENT FACILITIES

The City proposes to expand the existing WWTP from its current capacity of 12 mgd to 16 mgd. The WWTP expansion will include the addition of new headworks to pretreat the estimated wet-weather peak flows for the planning period of 56 mgd. To assist with the processing of this peak flow, the WWTP will include a new 10 mgd equalization tank for the storage of wet-weather peak flows. The WWTP biological treatment system, consisting of three oxidation ditches, will be modified to include a fermentation zone for more efficient nutrient removal and an alum feed system will be added for chemical phosphorous removal capabilities. In addition to the biological treatment modifications and additions, numerous hydraulic improvements will be made in the WWTP to ensure the processing of peak flow. The existing ultraviolet (UV) disinfection system will also be replaced with a new upsized UV system to treat the increased flow.

The City also proposes to replace the existing biosolids treatment process which is nearing the end of its useful life with a new expanded biosolids treatment process which will be capable of treating the increased loading resulting from the expanded WWTP. The new process will use thermal hydrolysis pretreatment and mesophilic anaerobic digestion for digestion. The objective is to produce a Class A biosolids.

The City also proposes to expand the on-site reclaimed water pump station in anticipation of serving additional reclaimed water customers.

FUNDING STATUS

The facilities described above comprise the scope of Loan Nos. CG5 2017-375, SRF 2017-376, and SRF 2017-395 scheduled for funding in fiscal year 2018. The estimated project costs are summarized in the following tabulation:

CG5 2017-375

<u>PROJECT CLASSIFICATIONS</u>		<u>COSTS (\$)</u>
Construction		<u>1,500,000</u>
TOTAL		1,500,000
	Loan	1,275,000
Amount Designated for Principal Forgiveness		225,000
(Will not have to be repaid)		

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SRF 2017-376

<u>PROJECT CLASSIFICATIONS</u>	<u>COSTS (\$)</u>
Administrative & Legal	1,900,000
Engineering Basic Fees	4,400,000
Other Engineering Fees	900,000
Resident Inspection	4,800,000
Construction	<u>66,500,000</u>
TOTAL	<u>78,500,000</u>
Loan	78,500,000

SRF 2017-398

<u>PROJECT CLASSIFICATIONS</u>	<u>COSTS (\$)</u>
Construction	<u>20,000,000</u>
TOTAL	<u>20,000,000</u>
Loan	20,000,000
Other Funds—(Local)	12,875,000

The City of Franklin has applied for two Clean Water State Revolving Fund (CWSRF) loans. The first loan (CG5 2017-375) will be for \$1,275,000 with \$225,000 in principal forgiveness that will not have to be repaid by the City. The second loan (SRF 2017-376) will be for \$78,500,000. The City will also apply for a third loan (SRF 2017-398) which will be for \$20,000,000. The City will provide \$12,875,000 of local funding.

B. EXISTING ENVIRONMENT

The City of Franklin's Planning Area is located in Williamson County in middle Tennessee. A discussion of existing environmental features in the area includes the following:

SURFACE WATERS

Surface waters within the proposed planning area include the Harpeth River and its tributaries. Designated uses for the Harpeth River include industrial water supply, fish and aquatic life, recreation, irrigation, and livestock watering and wildlife. The City of Franklin supplies drinking water to most of the planning area. The raw water is obtained from a surface water intake on the Harpeth River upstream of the City of Franklin's WWTP effluent discharge point. The City also purchases water from Harpeth Valley Utility District that obtains its raw water from the Cumberland River.

GROUNDWATER

The underlying geologic formations in the City of Franklin's Planning Area derive from the Ordovician Period. The Ordovician formation is composed of relatively pure limestone 30 meters thick or greater, separated by shaley limestone. Sinkholes and depressions are numerous. Some residents in the planning area may use groundwater from wells and springs for their

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drinking water supply. Groundwater in the planning area occurs primarily in fractures in the underlying bedrock and the quality is considered to be good.

SOILS

Soil associations occurring in the City of Franklin's Planning Area include the Lindside-Armour-Huntington, Sulphurs-Dellrose-Bodine, and Stiversville-Culleoka-Inman Associations. Soils in the Lindside-Armour-Huntington Association range from 2 to 10 feet deep. They are well to moderately drained, are very fertile, and are located adjacent to the Harpeth River, mainly in bottom land. The Sulphura-Dellrose-Bodine Association is found on steep and rocky slopes. This association is not usually suitable for cultivation, and is characterized as cherty, droughty, and rocky. Soils in the Stiversville-Culleoka-Inman Association are fertile and may be cherty and rocky where eroded.

TOPOGRAPHY

The City Franklin's Planning Area is located in the Inner Central Basin province and consists of gently rolling to hilly terrain with meandering low-gradient streams.

OTHER ENVIRONMENTAL FEATURES

No wild or scenic rivers or unique agricultural, scientific, cultural, ecological, or natural areas were identified in the City of Franklin's Planning Area. The Harpeth River courses through the Franklin Planning Area in Williamson County but is not considered a scenic river until well downstream of the proposed project location (approximately 22 river miles).

C. EXISTING WASTEWATER FACILITIES

The City of Franklin's wastewater treatment system consists of a WWTP, a recycled water system for the beneficial reuse of treated WWTP effluent; and the collection system. The WWTP is permitted under NPDES #TN0028827. It is a biological process that is currently permitted for a 12 mgd discharge to the Harpeth River. The original WWTP was placed into operation in 1975 with a design capacity of 2.5 mgd. In 1990 the design capacity was increased to 5.5 mgd, to 6.5 mgd in 1999, and to 12 mgd in 2003. The headworks facility contains two mechanically cleaned bar screens and two vortex chamber type grit removal units. Inorganic material removed by the headworks is hauled to the landfill. Three oxidation ditches are next in the treatment process. Each basin contains an anoxic zone that provides denitrification and an aeration zone that removes biological oxygen demand (BOD) and provides ammonia nitrification. Next in the treatment process are six final clarifiers. The final clarifiers are used to separate mixed liquor suspended solids (MLSS) from the biologically treated wastewater and to remove any scum from the surface of the clarifiers. Return activated sludge (RAS) from the clarifiers is pumped back to the oxidation ditches where it is mixed with influent wastewater. Flow from the clarifiers is routed to five denitrification filters. After filtration, the flow receives ultraviolet disinfection and post aeration. Dissolved air flotation thickeners are used to thicken waste activated sludge (WAS) from the clarifiers prior to dewatering by belt filter presses. The dewatered cake is transported via truck for disposal at a permitted local landfill. The Franklin WWTP discharges treated effluent from its outfall location into the Harpeth River at River Mile 85.2.

In 1992, the City of Franklin entered into an agreement with the Legends Club of Tennessee for the use of reclaimed water on the 36-hole golf course owned and operated by the club. Since

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that time, the City has attempted to expand this program for the beneficial reuse of treated WWTP effluent and agreed upon a Missions Statement in 2003 that was ratified by the Board of Mayor and Aldermen. This statement included recycling of treated wastewater as part of the effective management of its water resources. The existing reclaimed water distribution system has been designed to transport reclaimed water to a variety of customers around the City. The City's ultimate plan is to complete a distribution loop around the entire City to provide a reliable source of reclaimed water to its customers.

The oldest portions of the City's collection system were constructed in the early 1960's. As a result of age, some infiltration and inflow has been identified for those old sections of gravity lines. In 2007, the City undertook a project to begin to reline the existing sewer lines identified for rehabilitation. In 2007, approximately 3,500 linear feet (LF) were relined, and in 2009 a project was undertaken on the main portion of the Sharpe's Branch Interceptor to reline approximately 5,550 LF of 16-, 18-, 24-, and 30-inch ductile iron pipe. The large main stem of the Franklin collection system along the Harpeth River was replaced with fiberglass reinforced pipe beginning in 2002 and continuing to 2004. The remainder of the Franklin collection system is comprised of polyvinyl chloride (PVC), ductile iron, and fiberglass reinforced pipe (FRP) gravity sewer pipe less than 15 years old.

The WWTP currently operated under the National Pollutant Discharge Elimination System (NPDES) Permit No. TN0028827 that includes the following parameters and effluent limitations:

<u>PARAMETER</u>	<u>EFFLUENT LIMITATIONS</u>
CBOD ₅ (summer)	4 milligrams per liter (mg/l)
CBOD ₅ (winter)	10 mg/l
Total Nitrogen (summer)	5.0 mg/l
Total Nitrogen (winter)	Report
Total Phosphorus (summer)	5.0 mg/l
Total Phosphorus (winter)	Report
Suspended Solids (summer)	10 mg/l
Suspended Solids (winter)	30 mg/l
E. coli	126/100 colonies per milliliter
Dissolved Oxygen	8.0 instantaneous minimum
Ammonia as N (summer)	0.4 mg/l
Ammonia as N (winter)	1.5 mg/l
Chlorine Residual, Total	0.02 instantaneous maximum
Settleable Solids	1.0 milliliter/liter daily maximum
pH	6.0-9.0 (Standard Units)

D. NEED FOR PROPOSED FACILITIES AND ACTIONS

The WWTP improvements are necessary to expand and upgrade the treatment system and facilities based on projected population growth factors for the next 30 years. Hydraulic and biological improvements at the City's existing WWTP have been identified as the most cost

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effective and efficient method to expand the wastewater system to gain the additional required capacity and accommodate future growth. It has been determined based upon population projections that the capacity at the existing WWTP should be increased to 16 mgd average annual daily flow while providing flow equalization necessary to limit peak flows through the biological processes to 33 mgd.

Existing and projected facility conditions are shown in the following table:

EXISTING AND PROJECTED FACILITY CONDITIONS

<u>POPULATION</u>	<u>EXISTING (2017)</u>	<u>PROJECTED (2047)</u>
City	72,305	169,923
% Sewered	98%	99%
Planning Area Excluding Franklin	10,725	12,648
% Sewered	0%	0%
Total Planning Area	83,030	182,571
% Sewered	85%	92%
<u>CITY WWTP FLOWS (MGD)</u>	<u>EXISTING (2017)</u>	<u>PROJECTED (2047)</u>
Residential	6.8	19.1
Commercial	1.87	5.6
Industrial	0.045	0.045
Infiltration/Inflow (during rainfall events)	0.85	0.755
TOTAL	9.56	25.5

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Per the final NPDES Permit issued on June 1, 2017, effluent limits for the City of Franklin's proposed 16 MGD WWTP have been established and are listed below:

<u>PARAMETER</u>	<u>EFFLUENT LIMITATIONS</u>
CBOD ₅ (summer)	3 milligrams per liter (mg/l)
CBOD ₅ (winter)	7.5 mg/l
Total Nitrogen	290 lb/day (annual average)
Total Phosphorus	63,693 lb/yr (rolling average)
Suspended Solids (summer)	7.5 mg/l
Suspended Solids (winter)	23 mg/l
E. coli	126/100 colonies per milliliter
Dissolved Oxygen	8.0 instantaneous minimum
Ammonia as N (summer)	0.3 mg/l
Ammonia as N (winter)	1.1 mg/l
Chlorine Residual, Total	0.02 instantaneous maximum
Settleable Solids	1.0 milliliter/liter daily maximum
pH	6.0-9.0 (Standard Units)

E. ALTERNATIVES ANALYSIS

Several alternatives, including a "No-action" alternative, were evaluated for wastewater treatment in the August 2015 facilities plan. A summary discussion of the evaluation of each alternative for wastewater treatment and the selection of the recommended plan follows:

Wastewater Treatment Alternatives

NO ACTION

The "No-action" approach was not a viable alternative. As the City continues to grow, the existing WWTP will not be able to handle the increase in flows resulting in overflows throughout the system and potential NPDES violations.

Construction of a new South WWTP

This alternative would maintain the existing WWTP at the current capacity of 12 mgd and construct a new WWTP on the City's property in the Goose Creek area. This new WWTP would be located approximately three miles upstream of the existing WWTP and would be an advanced treatment facility. The new facility would include pretreatment, membrane bioreactors for biological treatment and UV disinfection. The new facility would also include advanced oxidation of the effluent and polishing of the effluent discharge through constructed wetlands adjacent to the Harpeth River prior to aeration and discharge. The new facility would have a capacity of 4 to 8 mgd based on the nominal sizing of the equipment. This alternative was not the most cost-effective and was rejected.

Alternative effluent disposal options

This alternative would involve using alternative effluent disposal options to limit and/or minimize the need for expansion of the existing WWTP. The feasibility of entering into agreements with Metro Water Services or Harpeth Valley Utility District to receive and treat additional flow from the City of Franklin service area was investigated. This option would

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involve a large investment into a conveyance system including piping and pumping, and would involve the uncertainties of entering into and maintaining service agreements with the providers. This was not the most cost-effective alternative and was rejected.

Expansion of the existing WWTP to 16 mgd

This alternative would involve expanding the treatment capacity of the existing WWTP from 12 mgd to 16 mgd. The plant expansion would include new headworks to pretreat the estimated wet-weather peak flows for the planning period of 56 mgd. To assist with processing this peak flow, a new 10-mgd equalization tank would be constructed for the storage of wet-weather peak flows. The plant biological treatment system, consisting of three oxidation ditches, will be modified to include a fermentation zone for more efficient nutrient removal and an alum feed system will be added for chemical phosphorous removal capabilities. Hydraulic improvements will also be made to ensure the processing of peak flow. The existing UV disinfection system will be replaced and upsized to treat the increased flow. This alternative is the most cost-effective and is selected.

Biosolids treatment alternatives

No action

The "No-action" approach was not a viable alternative. The existing biosolids treatment system and equipment are at the end of their useful life. The entire system will need to be replaced and expanded for the proposed additional WWTP capacity.

Rotary drum thickening, digestion, and screw press dewatering

This alternative would involve using rotary drum thickening. Polymer is mixed with sludge which is then fed into rotating screen drums which are covered with filter fabric. Thickened sludge rolls out of the end of the drums, while separated water decants through the filter fabric. Anaerobic digestion would then be used to perform a series of biochemical transformations. Screw press dewatering would then be used to produce a biosolids rated as Class B and acceptable for agricultural use. Since the City wishes to produce a Class A biosolids which would not be subject to disposal regulations and diminishing disposal options, this alternative was rejected.

Rotary drum thickening, digestion, screw press dewatering, and solar drying

This alternative would incorporate the same processes as in the previous alternative, with the addition of solar drying. Dewatered biosolids would be transferred to large greenhouse type structures where it would be spread uniformly on the floor to dry, with solar radiation evaporating the moisture. Machines would automatically till the solids, exposing moist solids to further drying. This alternative would produce a Class A biosolids, but is not the most cost-effective and was rejected.

Thermal hydrolysis pretreatment, digestion, and screw press dewatering

This alternative would involve using thermal hydrolysis (THP) to condition the biosolids prior to digestion and would not use a thickening treatment. THP is a process used to make the biosolids more conducive to downstream digestion and dewatering processes. A centrifuge would be used to dewater the biosolids prior to the THP treatment. The dewatered biosolids are then injected into the THP reactor where they are treated with steam for about 30 minutes at 285 to 330

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degrees F and pressurized at 90 to 220 psi before being fed to the digester at 9 to 10 percent solids. The digested biosolids produce a cake that typically exceeds 30 percent total solids concentration. A screw press is then used to further dewater the biosolids, producing a Class A biosolids. This is the most cost-effective alternative and is selected.

SLUDGE TREATMENT/DISPOSAL

The proposed project will produce a Class A biosolids and will not requires special disposal requirements.

F. ENVIRONMENTAL CONSEQUENCES; MITIGATIVE MEASURES

The environmental benefits of this project will be protection of public health and production of a Class A biosolids suitable for public use.

During the construction phase, short-term environmental impacts due to noise, dust, mud, disruption of traffic, runoff of silt with rainfall, etc., are unavoidable. Minimization of these impacts will be required; however, many of these minimization measures will be temporary and only necessary during construction. Using the following measures to prevent erosion will minimize impacts on the environment:

1. Specifications will include temporary and permanent measures to be used for controlling erosion and sediment.
2. Soil or landscaping maintenance procedures will be included in the specifications.
3. The contractor will develop an Erosion Control Plan. It will contain a construction schedule for each temporary and permanent measure controlling erosion and sediment. It will include the location, type, and purpose for each measure and the times when temporary measures will be removed or replaced.

These measures, along with requiring the contractor to return the construction site to as-good-as or better-than its original condition, will prevent any adverse impacts due to erosion.

Future discharges from the expanded WWTP will be in compliance with all Waste Load Allocations (WLAs) assigned in any relevant approved/established Total Maximum Daily Loads (TMDLs) that have been developed for this watershed. The proposed action will also comply with all relevant Phase I and/or Phase II stormwater regulations, including ensuring adequate sediment control and implementation of best management practices.

The state's Historic Preservation Officer has reviewed the project and has determined that the project will not impact known significant cultural resources.

No prime or unique agricultural lands or wetlands were identified and therefore will not be adversely affected. No endangered species of flora or fauna were identified within the proposed construction corridor. Effects on flora and fauna will be confined and temporary.

No endangered species of flora or fauna were identified within the proposed construction corridor. Effects on flora and fauna will be confined and temporary.

G. PUBLIC PARTICIPATION; SOURCES CONSULTED

A Public Meeting was held on July 14, 2016, at 6:00 p.m., local time. The selected plan for wastewater treatment and user charges were described to the public, and their input was received.

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At the projected time of the initiation of the loan repayment, the existing user rates for the typical residential user (5,000 gallons per month) of \$41.32. will be sufficient to repay the SRF loan. Therefore, no increase in user charges will be required.

Sources consulted about this project for information or concurrence were:

1. Tennessee Department of Agriculture
2. Tennessee Department of Economic and Community Development (ECD)
3. Tennessee Department of Environment and Conservation (TDEC), Division of Air Pollution Control (DAPC)
4. Tennessee Department of Transportation (TDOT)
5. Tennessee Historical Commission
6. TDEC, Division of Archaeology (DA)
7. Tennessee Geological Survey
8. TDEC, Division of Solid Waste Management (DSWM)
9. TDEC, Division of Water Resources (DWR)
10. Tennessee Wildlife Resources Agency (TWRA)
11. United States Army Corps of Engineers (USACE)
12. United States Fish and Wildlife Service (USF&W)
13. City of Franklin
14. Williamson County
15. CDM Smith, Nashville, TN